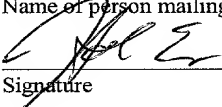


PATENT COOPERATION TREATY  
IN THE UNITED STATES ELECTED/DESIGNATED OFFICE

Applicant: SIEMENS METERING AG  
Title: METHOD OF CALLING A SUBSTATION BY A  
CENTRAL STATION IN A TRANSMISSION SYSTEM  
International Application No.: PCT/EP99/01433  
International Filing Date: March 5, 1999  
Priority Date: 23 April 1998 (23.4.1998)  
Attorney Docket No.: 1734-0001

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(Date of Deposit)

Harold C. Moore  
Name of person mailing Document or Fee  
  
Signature  
October 20, 2000  
Date of Signature

Assistant Commissioner for Patents  
BOX PCT  
Washington DC 20231

Dear Sir:

Applicant herewith submits to the United States Designated/Elected Office  
(DO/EO/US) the following items and other information:

1. (X) This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ( ) This is a SECOND or SUBSEQUENT submission of items concerning a filing  
under 35 U.S.C. 371.
3. (X) This express request to begin national examination procedures (35 U.S.C.  
371(f) at any time rather than delay examination until the expiration of the  
applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. (X) A proper Demand for International Preliminary Examination was made by the  
19<sup>th</sup> month from the earliest claimed priority date.
5. (X) A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. (X) is transmitted herewith (required only if not transmitted by the  
International Bureau).
  - b. ( ) has been transmitted by the International Bureau.
  - c. ( ) is not required, as the application was filed in the United States  
Receiving Office (RO/US).

Assistant Commissioner for Patents  
October 20, 2000  
Page 2

6. ( ) A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. (X) Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ( ) are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ( ) have been transmitted by the International Bureau.
  - c. ( ) have not been made; however, the time limit for making such amendments has NOT expired.
  - d. (X) have not been made and will not be made.
8. ( ) A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ( ) An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. (X) A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
11. ( ) An Information Disclosure Statement under 37 C.F.R. §1.97 and §1.98.
12. ( ) An Assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. §3.28 and §3.31 is included.
13. (X) A FIRST Preliminary Amendment.  
( ) A SECOND or SUBSEQUENT Preliminary Amendment.
14. ( ) A substitute specification.
15. ( ) A change of power of attorney and/or address letter.
16. (X) Other items of information:
  - (a) Translation of the International Application that includes the annexes to the International Preliminary Examination Report, which constitutes the application to be examined.
  - (b) Check in the amount of \$860.00 to cover the filing fee.

Assistant Commissioner for Patents  
October 20, 2000  
Page 3

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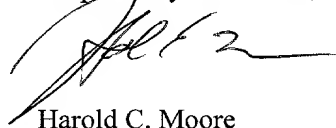
Harold C. Moore  
Maginot, Addison & Moore  
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Indianapolis, Indiana 46204-5130

CLAIMS AS FILED

For	Number Filed	Number Extra	Rate	Fee
Basic National Fee(37 C.F.R. 1.492 (a) (1)-(5):				
Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.			\$1,000.00	\$0.00
International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.			\$860.00	\$860.00
International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO.			\$710.00	\$0.00
International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4).			\$690.00	\$0.00
International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).			\$100.00	\$0.00
Total Claims	7- 20	0	\$ 18.00	\$0.00
Independent Claims	1- 3	0	\$ 80.00	\$0.00
Multiple Dependent Claims	any		\$ 270.00	\$0.00
Subtotal				\$860.00
Total Filing Fee				\$860.00

Please charge any deficiency or credit any overpayment to Deposit Account No. 13-0014, but not to include any payment of issue fees.

Respectfully Submitted,



October 20, 2000

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111 Monument Circle, Suite 3000  
Indianapolis, Indiana 46204-5130  
(317) 638-2922

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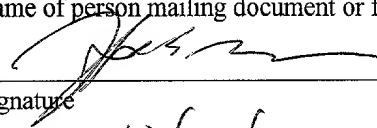
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Assistant Commissioner of Patents  
Washington, D.C. 20231

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Washington, D.C. 20231 on October 20, 2000  
(Date of Deposit)

Harold C. Moore

Name of person mailing document or fee

  
Signature

10/20/2000  
Date of Signature

Re:	Application of:	Erich Moos et al.
	Serial No.	NYA
	Filed:	Herewith
	For:	Method for Calling a Substation by a Central Station in a Transmission System
	Examiner:	NYA
	Our Docket:	1734-0001

PRELIMINARY AMENDMENT

Sir:

Prior to examination, please amend the above-identified patent application as set forth below. It is respectfully submitted that no fees are due in connection with this amendment. However, please charge any fee deficiency or credit any overpayment to deposit account no. 13-0014.

003221 6962960

IN THE SPECIFICATION

Please amend the Specification at page 1b as follows:

At line 18, please replace “belong” with --correspond--; and

At line 31, please replace “mentioned such a” with --mentioned, one such--.

It is respectfully submitted that the above amendments are mere clarifications of language and do not constitute new matter. In particular, the amendments do not change the meaning, but rather merely clarify the meaning, of the text. The context of the amended material within the originally filed specification provides clear support for the amendments.

Please amend the Specification at page 2 as follows:

At line 3, please replace “then involve” with --thus employ--;

At line 9, please replace “in respect of” with --to--; and

At line 11, before “electricity”, please insert --corresponding--.

It is respectfully submitted that the above amendments are mere clarifications of language and do not constitute new matter. In particular, the amendments do not change the meaning, but rather merely clarify the meaning, of the text. The context of the amended material within the originally filed specification provides clear support for the amendments.

Please amend page 3 of the Specification as follows:

At line 18, please replace “(N ‘no’)” with --N (‘no’)--;

At line 23, please replace “belonging” with --corresponding--;

At line 24, please replace “clarified” with --determined--;

At line 27, please replace “the latter”, first instance, with --decision block 12--; and

At line 27, please replace “the latter”, second instance, with --the former--.

It is respectfully submitted that the above amendments are mere clarifications of language and do not constitute new matter. In particular, the amendments do not change the meaning, but rather merely clarify the meaning, of the text. The context of the amended material within the originally filed specification provides clear support for the amendments. By way of example, support for the amendments of line 27 of page 3 may be found by reference to Fig. 2 and the accompanying text.

## IN THE CLAIMS

Please cancel claims 1-7, without prejudice.

Please add the following new claims:

8. (new) A method of calling a substation by a central station in a transmission system for the purposes of information transmission for remote reading of electricity meters by way of a communication channel selected from a plurality of communication channels, wherein the plurality of communication channels are divided into communication groups, wherein the communication channels within a communication group have the same communication properties, the method comprising:
- a) identifying a first communication group associated with a select substation to be called;
  - b) determining whether any communication channel of the first communication group is free;
  - c) acquire meter reading data over a free channel of the first communication group if it is determined that any communication channel of the first communication group is free; and
  - d) waiting and repeating step b if it is determined that no communication channel of the first communication group is free.

9. (new) The method of claim 8 wherein each of the communication groups is associated with a specific code word, the specific code word representative of a memory address.
10. (new) The method of claim 8 wherein step c) further comprises storing an item of busy information for the free channel.
11. (new) The method of claim 10 wherein storing the item of busy information for the free channel comprises setting a flag.
12. (new) The method of claim 10 wherein storing the item of busy information comprises storing a code word which is stored in a memory of the central station.
13. (new) The method of claim 10 wherein storing the item of busy information comprises storing the item of busy information in an operating system located in the central station.
14. (new) The method of claim 10 wherein storing the item of busy information comprises storing the item of busy information in an application software located in the central station.



15. (new) An arrangement for information transmission for remote reading of electricity meters over a communication system, the arrangement comprising:
- a plurality of communication channels divided into communication groups, wherein the communication channels within a communication group have the same communication properties,
  - a substation associated with a first communication group;
  - a central station coupled to the plurality of communication channels, the central station operable to
    - a) determine whether any communication channel of the first communication group is free,
    - b) acquire meter reading data over a free channel of the first communication group if it is determined that any communication channel of the first communication group is free, and
    - c) waiting and repeating the step c if it is determined that no communication channel of the first communication group is free.
16. (new) The arrangement of claim 15 wherein the central station is further operable to associate each of the communication groups with a specific code word, the specific code word representative of a memory address.
17. (new) The arrangement of claim 15 wherein the central station is further operable to store an item of busy information for the free channel.

18. (new) The arrangement of claim 17 wherein the central station is further operable to store the item of busy information for the free channel by setting a flag.

19. (new) The arrangement of claim 17 wherein the central station is further operable to store the item of busy information by storing a code word which is stored in a memory of the central station.

20. (new) The arrangement of claim 17 wherein the central station is further operable to store the item of busy information by storing the item of busy information in an operating system located in the central station.

21. (new) The arrangement of claim 17 wherein the central station is further operable to store the item of busy information in an application software located in the central station.

It is respectfully submitted that support for all of the claims may be found in the application as filed. In particular:

Support for claim 8 may be found in, among other places, claim 1, Fig. 2, and at page 2 line 17 to page 3, line 32 of the application as filed;

Support for claim 9 may be found in, among other places, claim 2, and at page 2, lines 26-28 of the application as filed;

Support for claim 10 may be found in, among other places, claim 3, and at page

2, lines 28-31 of the application as filed;

Support for claim 11 may be found in, among other places, claim 4.

Support for claim 12 may be found in, among other places, claim 5.

Support for claim 13 may be found in, among other places, claim 6.

Support for claim 14 may be found in, among other places, claim 7.

Support for claim 15 may be found in, among other places, claim 1, Figs. 1 and 2,  
and at page 2 line 4 to page 3, line 32 of the application as filed;

Support for claim 16 may be found in, among other places, claim 2, and at page 2,  
lines 26-28 of the application as filed;

Support for claim 17 may be found in, among other places, claim 3, and at page 2,  
lines 28-31 of the application as filed;

Support for claim 18 may be found in, among other places, claim 4;

Support for claim 19 may be found in, among other places, claim 5;

Support for claim 20 may be found in, among other places, claim 6; and

Support for claim 21 may be found in, among other places, claim 7.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Respectfully submitted,

*Red En*

9

WO 99/56138

PCT/EP99/01433

Method of calling a substation by a central station in a transmission system

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The invention relates to a method of calling a substation by a central station in a transmission system as set forth in the classifying portion of claim 1.

10 The method is preferably used in a transmission system which serves for the remote reading of electricity meters.

15 The object of the invention is to provide a method of the kind set forth hereinbefore, which permits optimum, parallel and synchronous utilisation of all available communication means for a group of substations so that a central station, by way of communication channels of that group, detects simultaneously and in an optimum fashion data and in particular measurement data of electricity meters, of all associated substations.

In accordance with the invention the specified object is attained by the features recited in the characterising portion of claim 1. Advantageous embodiments of the invention are set forth in the appendant claims.

20 An embodiment of the invention is described in greater detail hereinafter and illustrated in the drawing in which:

Figure 1 is a diagrammatic view of a transmission system, and

Figure 2 shows a flow chart for data acquisition.

25 A transmission system diagrammatically shown in Figure 1 comprises a central station Z which is connected to substations by way of a plurality of communication channels. The transmission system serves preferably for remote reading of electricity meters which belong to the substations and are connected thereto. The central station Z must be capable of simultaneously actuating a plurality of communication channels in order to  
30 acquire the data of the substations in parallel relationship. The central station Z includes hardware HW, an operating system BS and application software ASW (user software). The hardware HW is connected to the substations by way of the plurality of communication channels. As the

individual substations have different communication parameters such as transmission mode, control sign and so forth, in accordance with the invention the individual communication channels are combined to form communication groups. The plurality of the communication channels is thus subdivided into communication groups involving the same property or identical parameter values. In that case each communication channel of a communication group is so selected that it has the same communication parameters as the other communication channels of the communication group. As already mentioned such a parameter is the transmission mode, for example a half-duplex or full duplex mode. The communication channels of the same communication group then involve the same transmission mode. It is assumed in Figure 1 that there are three communications groups GRI, GRII and GRIII, wherein for example the communication group GRI has four communication channels, the communication group GRII has n communication channels and the communication group GRIII has three communication channels. When defining a substation, a communication group which has the communication parameters which are applicable in respect of that substation is associated with that substation. By way of the communication channels of that communication group, the central station Z can acquire the data, for example measurement data of the electricity meters, of the substations in question. That permits optimum, parallel and synchronous utilisation of all available communication means for a communication group of substations. For reasons of simplicity of the drawing, Figure 1 shows only a single substation  $US_m$  which is connected to the m-th communication channel of the communication group GRII.

The method according to the invention of calling a substation, for example  $US_m$ , by the central station Z of the transmission system for the purposes of information transmission by way of a communication channel, for example m, which was called from the plurality of the communication channels, provides that, within a selected communication group, for example GRII, which has the desired properties or parameter values, a communication channel m is called, which is still communication-free. If all n communication channels of the communication group GRII in question

are already busy, the central station Z goes into a waiting condition until at least one of the communication channels of the communication group GRII in question is communication-free. For that purpose, each communication group GRI, GRII and GRIII of the communication channels preferably has its own code word, for example as an address, associated therewith. When a communication channel is busy with a communication, an item of busy information is stored in the central station Z, from which the central station Z recognises that the communication channel in question is already busy. Storage of the item of busy information preferably involves setting a flag or storing a code word in a memory of the central station Z. In that case the item of busy information is stored in the operating system BS in the central station Z or in the application software ASW in the central station Z.

Acquisition of the data of the substations by the central station Z takes place in accordance with the flow chart shown in Figure 2. It includes 6 functional blocks 10 to 11 and 13 to 16 and a decision block 12 which are connected in series in the sequence of their numbering. The functions A, B, C, D, E, F or G are associated in the specified sequence with the blocks 10 to 16, wherein the functions involve the following significances:

- A start of a data acquisition of a given substation,
- B reading of the designation of the associated communication group,
- C questioning whether a communication channel of that communication group is free or not free,
- D occupying a free communication channel,
- E acquiring the data,
- F releasing the communication channel used for communication purposes, and
- G end of data acquisition.

The decision block 12 has a yes-output identified by Y ('yes') and a no-output identified by (N 'no'), the latter being connected to the input of the decision block 12 while the former is taken to the input of the next function block 13 of the series arrangement.

After a start of the data acquisition procedure in accordance with function block 10, then in accordance with function block 11 the





## CLAIMS

1. A method of calling a substation ( $US_m$ ) by a central station (Z) in a transmission system for the purposes of information transmission by way of a communication channel (m) called from a plurality of communication channels, characterised in that the plurality of communication channels is subdivided into communication groups (GRI, GRII, GRIII) of the same property or the same parameter values and that within a selected communication group (GRII) a communication channel (m) is called, which is still communication-free, or, if all (n) communication channels of the communication group (GRII) are already busy, the central station (Z) goes into a waiting condition until at least one of the communication channels of the communication group (GRII) becomes communication-free.

2. A method according to claim 1 characterised in that associated with each communication group (GRI, GRII, GRIII) of the communication channels is its own specific code word.

3. A method according to claim 1 or claim 2 characterised in that when a communication channel is busy with a communication an item of busy information is stored in the central station (Z), from which the central station (Z) recognises that the communication channel in question is already busy.

4. A method according to claim 3 characterised in that storage of the item of busy information consists of setting a flag.

5. A method according to claim 3 characterised in that storage of the item of busy information comprises storing a code word which is stored in a memory of the central station (Z).



Fig. 2

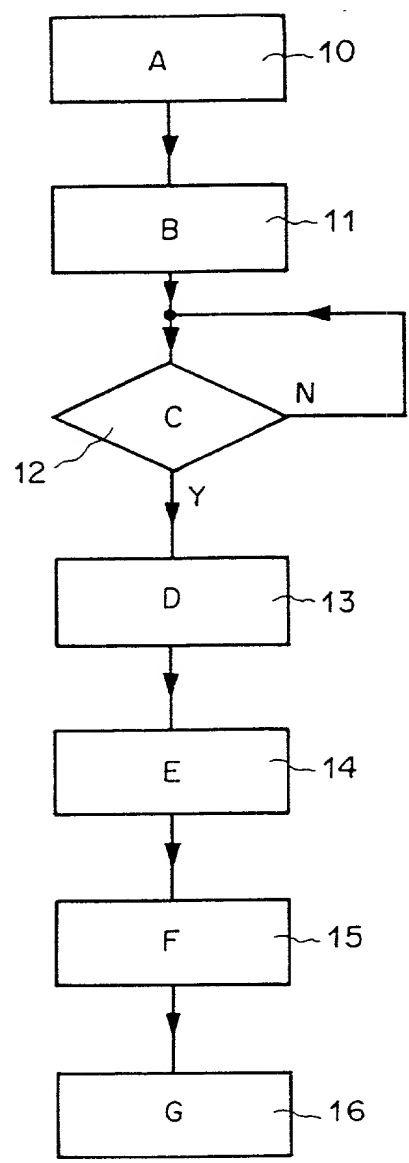
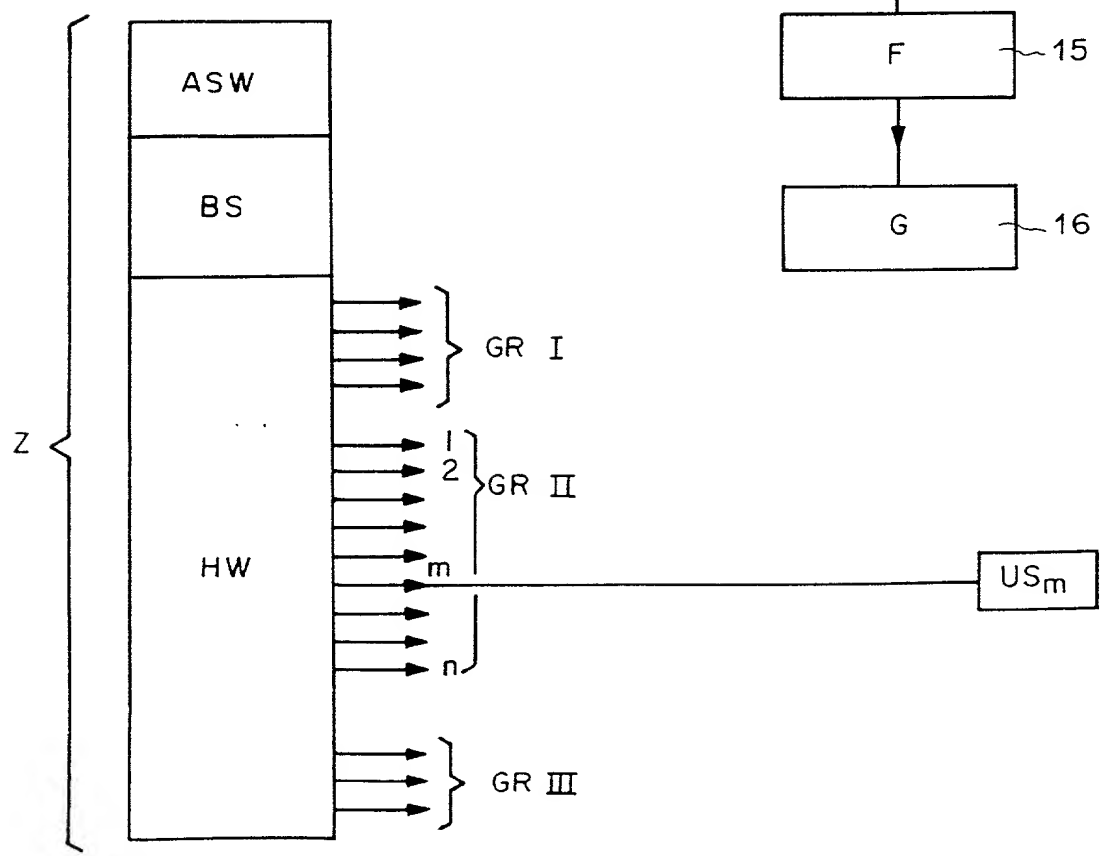


Fig. 1



We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

We hereby appoint the following attorney(s) with full power of substitution and revocation, to prosecute said application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith:

Attorney Name(s):	<u>Harold C. Moore</u>	Reg. No:	<u>37,892</u>
	<u>Paul J. Maginot</u>		<u>34,984</u>
	<u>Bradford G. Addison</u>		<u>41,486</u>
	<u>Bruce J. Bowman</u>		<u>35,458</u>
	<u>Shawn D. Bauer</u>		<u>41,603</u>
	<u>David M. Lockman</u>		<u>34,214</u>

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Inventor's  
signature\_

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Citizenship: Switzerland

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Full name of 2<sup>nd</sup> joint inventor: Peter Hess

Inventor's  
signature\_

Date 14.12.00

Residence: St. Wolfgangstrasse 7b  
CH-6331 Hünenberg

Citizenship: Switzerland

Post Office Address: Same as above

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